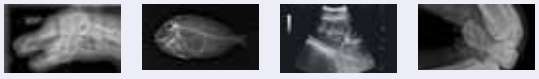
Reveal™

Imaging the possibilities

User Manual

sound-eklin™



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Reveal™ is a powerful, easy-to-use PACS viewer by Sound-Eklin™. We thank you for purchasing **Reveal™**, and we are confident that it will be one of the most useful tools in your digital imaging solution.

Some of the powerful features you'll find in **Reveal™** 2.01:

- User-friendly, intuitive interface
- Window/level (with user-defined presets)
- Zoom/pan and magnify (with match scale)
- Rotate/flip
- Undo/redo
- Invert (with window/level feature)
- Overlays toggle
- Measurement and measurement calibration (with use of image calibration ball)
- ROI (ellipse, rectangle) with mean and standard deviation
- Clipboard (with export to image and video)
- Thumbnails
- Multi-frame image support
- Image stacking/stack sorting (image number, slice location, acquisition time)
- Synchronized stacking
- Cine
- Study anonymization ability
- Multiple image layout choices
- Spatial locator
- Reference lines
- Protractor
- Image text annotations
- DICOM header viewer/editor
- Drag & drop image export

Recommended System Requirements

To guarantee optimum performance of **Reveal™**, your computer system should meet the specifications given below.

NOTE: A faster processor and more powerful video cards will improve performance.

- Windows XP (SP1, SP2, SP3), Windows Vista Business Edition or Windows Vista Ultimate Edition (32 bit only) Note: Vista machines must have UAC turned OFF for **Reveal™** to work properly.
- Intel Core 2 Duo or AMD Athlon 60 x 2 processors with 2GB RAM or more
- 250MB video card or higher
- Gigabit ethernet card
- CDRW/DVDRW
- 1024 X 768 monitor resolution (with 32bit True Color)
- 3.5 .Net Framework
- Broadband Internet connection for installation updates
- Static IP address or set dynamic range

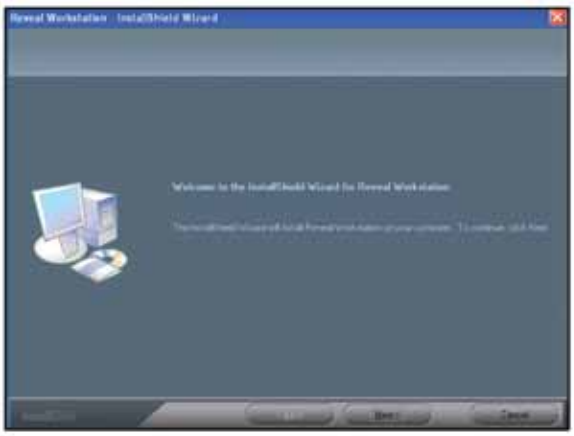
Installing Reveal™

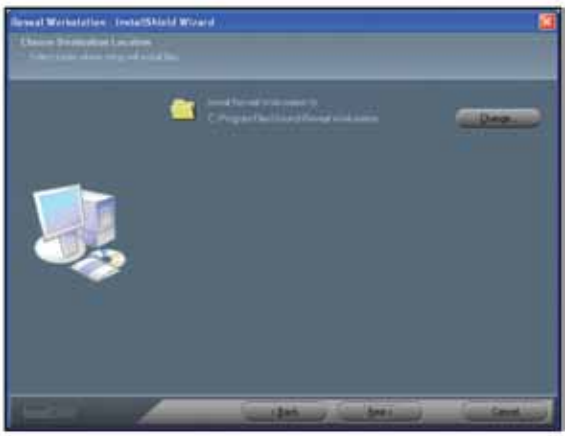
Requirements for installing **Reveal™** on your PC:

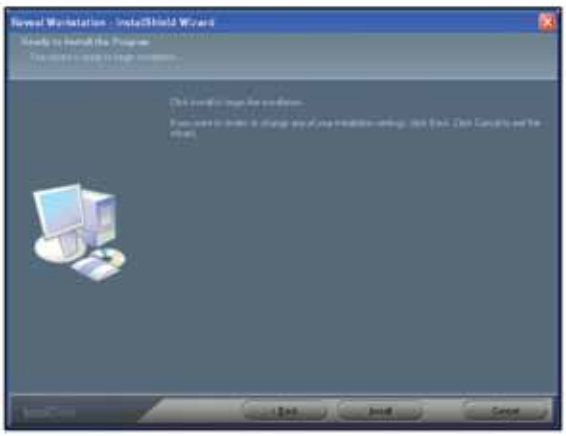
- Be sure to have an internet connection before you begin.
- A static IP address is required for all computers installing **Reveal™**.
- **Reveal™** is a licensed product; be sure to obtain your license key prior to installation. The key is valid only for the number of licenses purchased. (If you would like to purchase additional licenses, please contact our Inside Sales department at (800) 268-5354 Option 1.)
- Log on to your computer as an administrator to install **Reveal™**

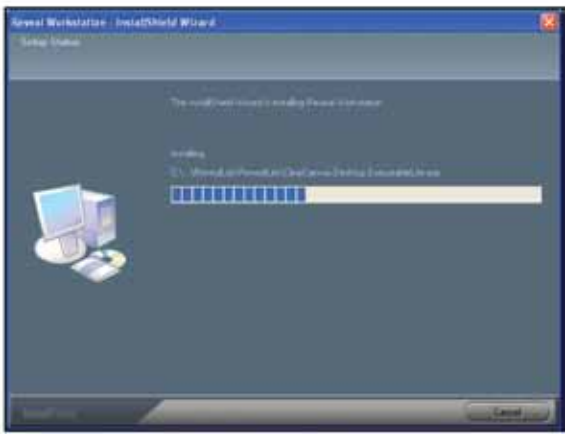
1. Run the **Reveal™** setup from the computer's desktop.

2. Follow the setup's prompts, clicking **Next** after each completed step:



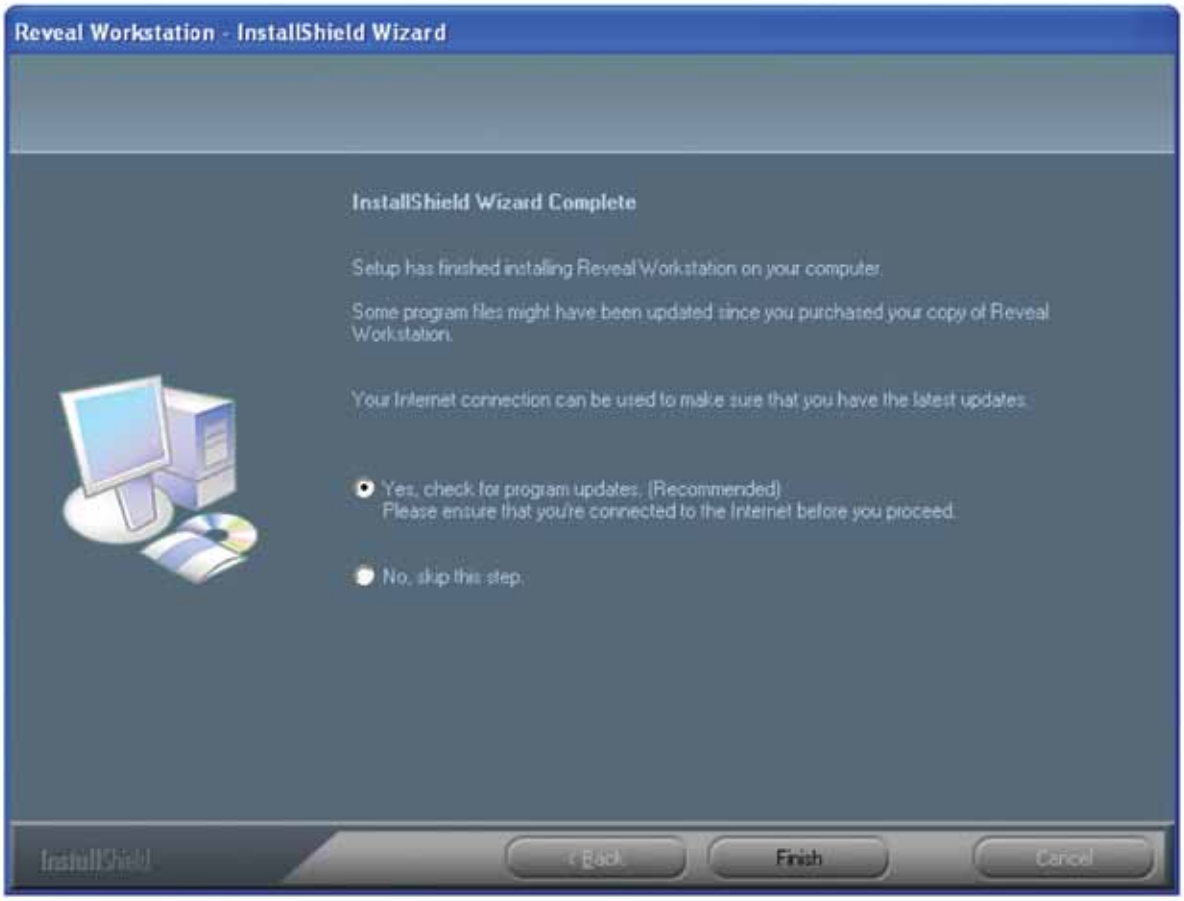






Installing Reveal™ *(continued)*

3. Allow **Reveal™** to update by accessing the internet. Accept any license agreements,and click Next to continue when prompted. If not already installed, .Net Framework must be installed at this point. Your system will prompt you if an update is needed on your computer an internet connection is required for this portion of the install. Accept the license agreements and continue with the .Net install.


Reveal Workstation - InstallShield Wizard
InstallShield Wizard Complete
Setup has finished installing Reveal Workstation on your computer.
Some program files might have been updated since you purchased your copy of Reveal Workstation.
Your Internet connection can be used to make sure that you have the latest updates.
Yes, check for program updates. (Recommended)
Please ensure that you're connected to the Internet before you proceed.
No, skip this step.
InstallShield
< Back
Finish
Cancel

4. Click on the **Reveal™** Workstation icon on the desktop.

5. Install the license key provided with your **Reveal™** Install CD, and click **Activate**.

6. Restart your computer.

Reveal™ is now installed. Next, proceed to **Reveal™** Configuration to configure your DICOM server.

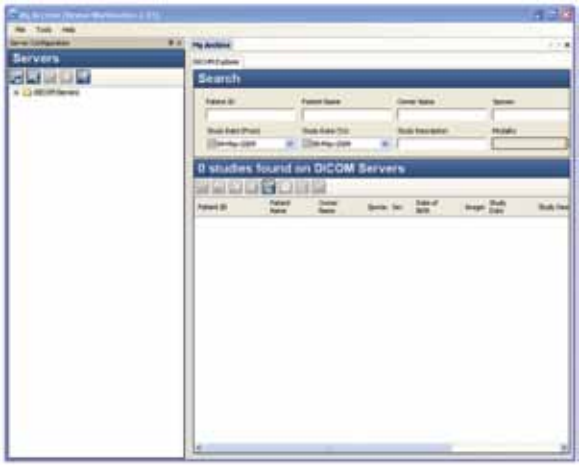
Reveal™ Configuration

Reveal™ works by querying and retrieving information from a DICOM server. The following steps will guide you through configuration of the **Reveal™** software with your DICOM server.

- Before beginning, obtain the AE Title, Port, and IP address of the remote DICOM server. This information was provided by the Field Applications Specialist who installed the DICOM server at your location.
- Typically, the AE title is SOUNDSERV1, and the Port is 5678. The IP address will be the IP address of the DICOM server.

1. To install the remote and local DICOM servers, open **Reveal™**. On the My Archive screen, click the **Server Configuration** tab at the left of the window.

A remote DICOM server is any server you will send or receive images from. The local DICOM server is what serves images in a given installation of Reveal™.



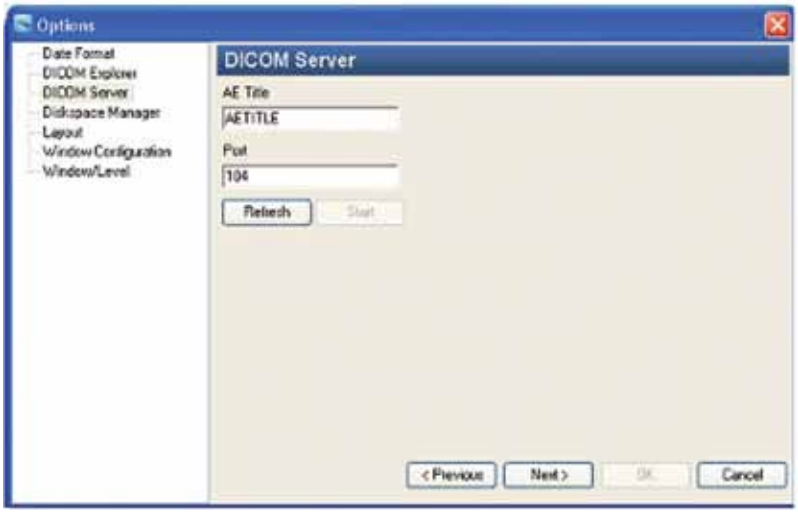
2. Click the **Add Server** button. Fill in the Server Name, Host (DICOM server's IP address), Location, AE Title, and Port. Click OK.

3. After you have added your new server, click the **Verify** button to test your connection.

NOTE: The DICOM server must be running and all local firewalls turned off!

Reveal™ Configuration *(continued)*

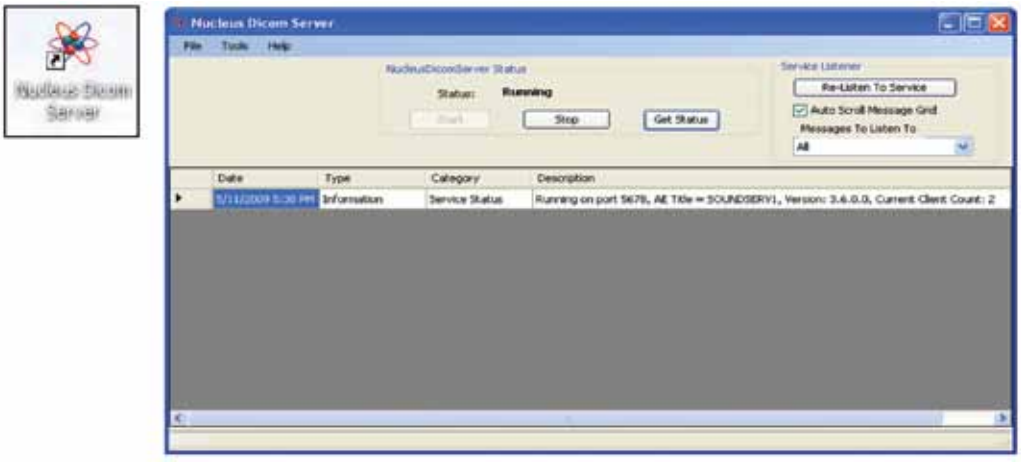
4. On the My Archive screen, click **Tools**, then **Options**, and then **DICOM Server** to set the **Reveal™** local server information.



5. Change the AE Title to a specific name for this **Reveal™** station (such as “workstation1” or “treatment”), and use a port not already in use by another **Reveal™** workstation. Once finished, click **Next**.

   NOTE: For Reveal™ to retrieve information from the DICOM server, the AE Title and Port need to be entered into the remote DICOM server.

6. Take your **Reveal™** AE Title, IP Address, and Port to your remote DICOM server. If that server runs Nucleus, double-click the **Nucleus** icon. (Steps will vary for other DICOM servers.)



Reveal™ Configuration *(continued)*

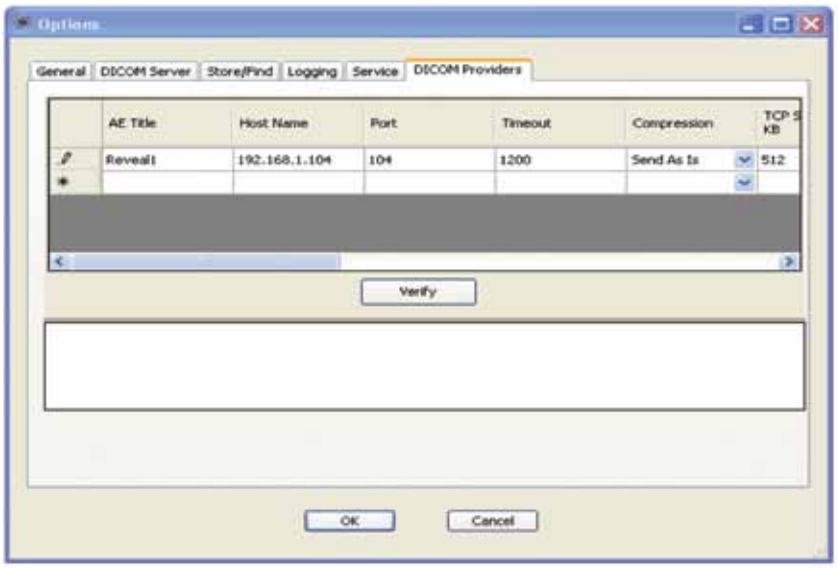
Click **Tools**, then **Options**, then the **DICOM Providers** tab.

Enter the AE Title, Host Name (IP address), and Port you created in **Reveal™**.

Set the Timeout to **1200**.

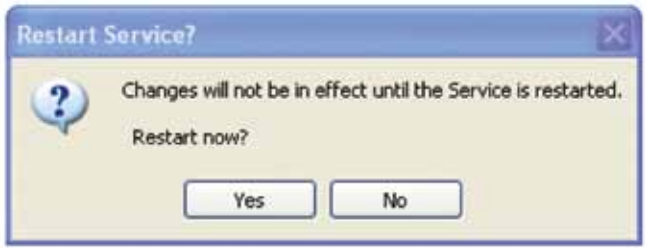
Set the compression to **Send As Is.**

Click **Verify**.



A Success dialog box will appear.

Click **OK**, and then click **Yes** to restart the service.

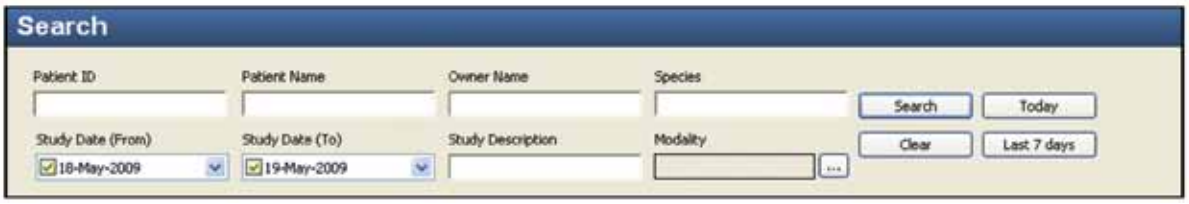


You will now be back in the main Nucleus DICOM Server window. System status should be **Running**. Close Nucleus and return to the computer running **Reveal™**

Reveal™ is now configured and ready to use.

Opening DICOM Images

To open a DICOM study, first search for a study in the database (query), using any of the search criteria. You can search any or all of the search fields (Patient ID, Patient Name, Owner Name, Species).



The "Today" button searches for all exams created with today's date. The "Last 7 Days" button searches for exams that were created within that time period. The "Clear" button clears all search fields including the date range. Remember that you are searching by the exam date, not the date on which the images were made (sometimes those dates differ).

Once you have queried the database and found the study you are looking for, you will need to retrieve the study. To do this, double-click on the exam, or click the **Retrieve Study** button to retrieve the study to **Reveal™**.

You will notice that prior to retrieving a study, the number of images contained in the study is displayed as (0/1); this means that no images have been loaded into this* Reveal™ *workstation. After double-clicking or using the Retrieve Study button, the number will change to (1/1) or however many images are in the study. These images are now loaded on this local* Reveal™ *workstation for interpretation.

To open the study, click the **Open Study** button, or double-click on the study itself. Your images are now open and ready to view.

To compare multiple studies in the same viewing window, hold the CTRL key and select all retrieved studies you wish to include.

Reviewing Images

Once you have opened the study, you can review it in the **Reveal™** viewing window.

To start, window and level will default to your right mouse key (hold and drag across the image on an angle). To zoom, click and drag with the left mouse key. Use the wheel on the mouse to toggle between images in the series.

When you have finished reviewing your study, right-click the **Patient** tab. You can then click **Close**, or click the **My Archive** tab to open a new study.

Button Functions

The functions of the **Reveal™** tool buttons are described below. To determine a button's function, position your cursor over the button, and its function will be displayed, along with instructions whether to left-click or right-click, if applicable.

Reveal™ has two types of tools: action tools that immediately trigger the selected function when clicked (e.g., rotate, flip, undo, reset), and mouse tools that, when clicked, change the function of one of the mouse buttons. Blue buttons are active, gray buttons are inactive.

Reset — Resets an image to its original state before manipulation.

Undo — Undoes the last action applied to the image, up to 100 actions.

Redo — Redoes the last undone action.

Show Thumbnails — Displays the study's or studies' images. Drag and drop to move the images into the viewing window. To close the box, left-click on the main active window with the current image.

Layout Manager — Allows for multiple viewing panes to be opened. The Layout Manager determines the number of rows and columns in the viewing window. The tile section lets you compound one pane to multiple images. The arrow down lets you quick-select a number of panes. Highlight the orientation and number of panes you want, then left-click to select. Click the default box to return to a 1 X 1 view.

Overlays — Lets you display and hide image text overlays. Left-click once to hide overlays on all images. Click again to restore the overlays.

Cine — Lets you control cine loops (speed, start, stop, pause). For use with cine video (ultrasound) or stacked image studies (CT and MRII).

Button Functions *(Continued)*

Window/ Level Lets you adjust image contrast. Select this, then hold down the right mouse button while moving across the image at an angle. Click the down arrow to copy the Window/Level and paste it onto another image. Your keyboard's F2 key is the default Window/Level setting (Auto).

Zoom Lets you magnify an image by 1, 2, 4, or 8 times. Select Zoom, then left-click and hold to zoom in and out. The down arrow allows you to fit the image to the tile you are viewing.

Magnify Glass Lets you move a magnifying window around the image. Left-click and hold on the image once this function is selected. Click the down arrow to select the level of magnification.

Pan Lets you move the image around the viewing window. Select this, then click and hold your right mouse button.

Invert Shows a negative of the image. Use Window/Level to adjust the image lightness and darkness in this mode.

Flip Vertical Changes the image orientation by flipping the image vertically.

Flip Horizontal Changes the image orientation by flipping the image horizontally.

Rotate Left Rotates the image counterclockwise 90 degrees.

Rotate Right Rotates the image clockwise 90 degrees.

Drag and Drop Lets you copy the image to your desktop as a .jpg.

Show Clipboard Displays the Show Clipboard window.

Button Functions *(Continued)*

	Stacking	Lets you change the order of CT images. Use the down arrow to set different orientations, such as acquisition time, slice number, or slice location.
	Hanging Protocols	Lets you change the image order by hanging protocols. Use the down arrow to select different orientations.
	Change Sort Order	Changes the order of images based on the sort preset. This function opens the Study Sort Order Editor. Mostly for equine, CT, and MRI use.
	Text Annotation	Lets you add text to the image. Click once to open the editor, then place the text on the image. You can then use the drag-and-drop or the clipboard to export the image with text.
	Match Scale	Lets you copy the scale of one selected image (yellow box) and paste it onto all other images in the viewing window. Multiple images must be displayed for this function to work.
	Probe	Lets you keep a reference point while reviewing a series of CT images.
	Ruler	Creates a line for measuring. Left-click and hold, then release and left-click again to set the line.
	Elliptical ROI	Draws a circle or ellipsis. Left-click and hold, then release and left-click again to set. Ellipsis size stats will be displayed.
	Rectangular ROI	Draws a rectangle. Left-click and hold, draw the rectangle, release, and left-click again to set the rectangle. Rectangle size stats will be displayed.
	Protractor	Takes angular measurements on the image. Left-click once and draw your first line, then left-click and release to draw the second line. Click a third time to set the angle.

Button Functions *(Continued)*

Reference Lines Lets you view reference lines to match a slice to a scout image in a CT or MRII Study.

Synchronized Stacking Synchronizes the viewing of different stacks of images that are in the same plane. For example, you may have two sets of axial CT images that were acquired with different parameters, but you want to view them together. That is, as you stack through one, you want the other to be synchronized according to slice location.

Display Hidden Icons To view hidden functions in **Reveal™**, click once to display buttons that are hidden due to monitor size.

Buttons not displayed:

Previous Display set, **Next Display** set (see Advanced Viewing Features, page 17, for more information).

Spatial Locator (see Advanced Viewing Features, page 17, for more information).

Keyboard Hotkeys

Function	Hotkey
Close Application	Alt+F4
Close Workspace	Ctrl+F4
Tools/Options	Ctrl+O
Undo/Redo	Ctrl+Z / Ctrl+Y
Cine (Activate)	C
Zoom (Activate)	Z
Pan (Activate)	P
Pan (Control)	Ctrl+Left-Click or Ctrl+(arrow keys)
Window/Level (Activate)	W
Flip Horizontal	H
Flip Vertical	V
Rotate Right	R
Rotate Left	L
Invert	I
Show/Hide Text Overlay	O

Advanced Viewing Features

Measurement Calibration

Most DICOM images come calibrated; that is, the size of each pixel in millimeters is encoded into the image. Some, however (most commonly ultrasound), are not. Such images are easily identifiable by measurements given in pixels rather than centimeters. Non-calibrated images can be calibrated manually by using the **Calibration Tool**:

1. Using the **Ruler** button , draw a line that corresponds to a known physical length in the image. (The longer the line is, the more accurate the resulting image calibration will be.) Ultrasounds often contain a scale of some form that can be used to calibrate the image.
2. Right-click on the measurement and select **Calibrate**.
3. In the dialog box that appears, enter the physical length that the line corresponds to.
4. Click **OK**.
5. The measurement should now appear in cm.

Manual calibration applies only to the current image being viewed, one at a time. If multiple images are open, they must each be calibrated separately. You can manually calibrate images that are already calibrated. However, use extreme caution in doing this. Fiducials must be used in projection-based modalities (i.e., DX) in order to calibrate the image properly, and this calibration is for interpretative reference only. Physical measurements should be preformed to confirm interpretative results with calibrations in all modalities.

Matching Scale

Using the **Match Scale** tool allows you to simplify visual comparison of measurements and ROI, particularly for comparisons of current and previous studies. To match scale for all visible images:

1. Set the desired zoom for one of the visible display sets (yellow-surrounded image).
2. Click the **Match Scale** button.

Advanced Viewing Features *(Continued)*

Sorting/Stacking Images

For CT studies it is often useful to sort images in a display set by various criteria, such as image number or slice location. To sort images:

1. Select the display set to be sorted.
2. Select the sort criteria from the drop-down menu next to the **Stack** button.

Reference Lines

Apply reference lines to help you see the intersection of images in different planes. To turn on reference lines:

1. Click the **Reference Lines** button.
2. Click on the display set whose images you want to see intersect with images in the other display set. The first, last, and current reference lines are displayed by default; stacking through a display set will cause the current reference lines to "move." Numbers beside each reference line correspond to the numbers of the intersecting images.
3. Clicking again on the **Reference Lines** button will remove all lines.

Previous Display Set and Next Display Set

When reviewing multiple display sets in one exam, you can easily move forward and back between sets using right and left arrows.

Spatial Locator

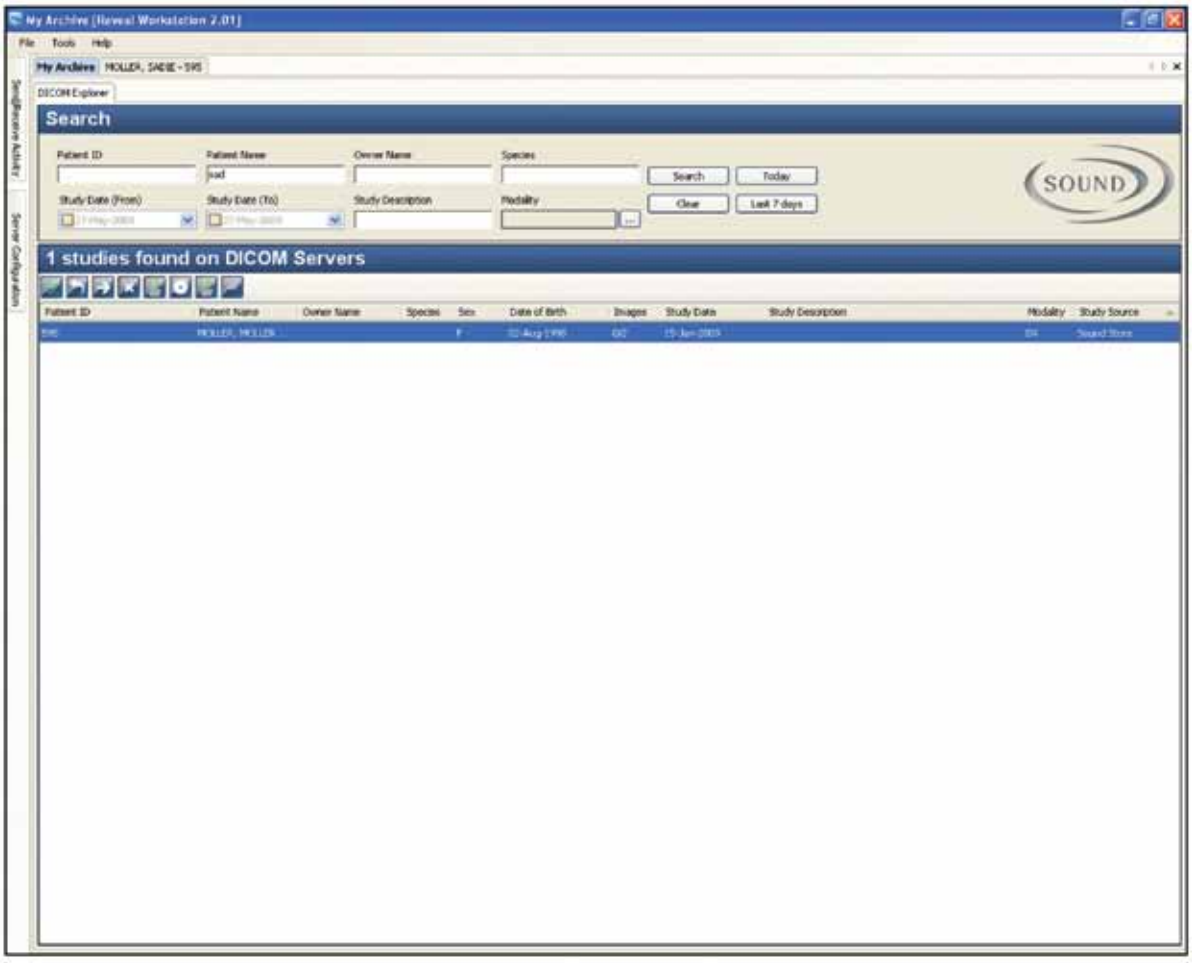
This tool allows you to pick a reference point that corresponds to all image planes. It is used mostly in CT and MRI studies.

Clipboard

The clipboard is used to hold manipulated or non-manipulated images from a series at one location. You can export directly from the clipboard to your computer in .jpg or video.

My Archive

From the My Archive screen you can perform many different tasks unrelated to image viewing. These include importing from other media, (i.e., CDs or email), creating CDs of an exam or multiple exams, or even exporting exams to your computer.



Once you have queried/retrieved a study, you can apply all the study functions as needed.

My Archive *(Continued)*

Open Study Once a study has been retrieved from the server or other external source, this button allows you to open the viewing window for the study.

Retrieve Study After searching for a study, you can retrieve it to the local **Reveal™** workstation using this function. (Double-clicking on the study will perform the same action.)

Send Study This function sends a study to another DICOM server that is set up in your server's tab. Note: There is no need to send a study back to the remote DICOM server once it has been retrieved. It will always reside on the remote server.

Delete Study This button removes the retrieved study from the local **Reveal™** workstation. Note: It will not remove the study from the Sound Nucleus DICOM server.

Import Study Allows you to import DICOM images from sources other than your remote DICOM server (i.e., CDs, email, removable storage devices).

Export to CD / DVD Creates a CD or DVD with images.

Export Study to Folder Use this to export a study to your computer for email or any other purpose.

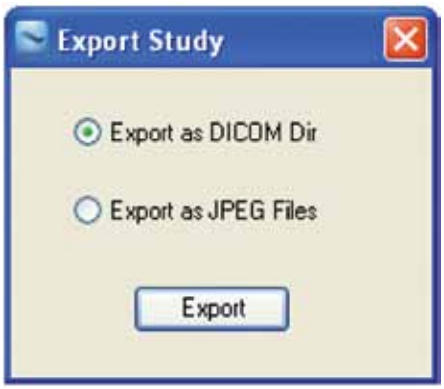
Anonymize Study Use this function to remove patient information and create an anonymous study. This is useful for showing clients two exams without disclosing the name of the other client.

My Archive *(Continued)*

Exporting a study to CD/DVD

Follow these steps to create a CD/DVD:

1. Search for and then select the study you wish to create a CD/DVD of.
2. Click on the **Export to CD/DVD** button.
3. Choose to export as a DICOM DIR only or as a DICOM DIR and JPEG CD.



4. The Export Study window will open. Insert a CD or DVD into your computer and click **Write Disk**.

To copy more than one study, press the Ctrl key on your keyboard and click on the retrieved study or studies you wish to export to CD. If you choose to export as a DICOM DIR, **Reveal™** ***Lite will be added to the CD for viewing the images.***

5. When the writing is complete, click **OK**.

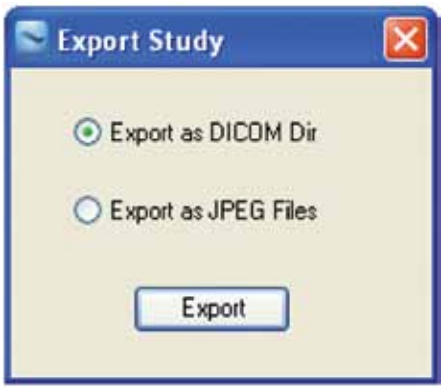
If you choose to cancel, you will be asked if you wish to clear the queued studies. If you click No, the images will be available next time you attempt to write a disk.

My Archive *(Continued)*

Exporting a Study to a Folder

Use the following steps to export a study from **Reveal™** to your computer:

1. Search for and then select the study you wish to export.
2. Click on the **Export Study to Folder** button.
3. Choose to export as a DICOM DIR or as JPEG Files.



4. Select the destination on your computer to export to.

DICOM DIR files must be opened by a PACS viewer such as **Reveal™**. ***JPEG images can be opened on any computer but cannot be manipulated as they can be in*** **Reveal™**. ***If you wish to export only one image, use drag and drop or the clipboard, in the image viewing window of the study.***

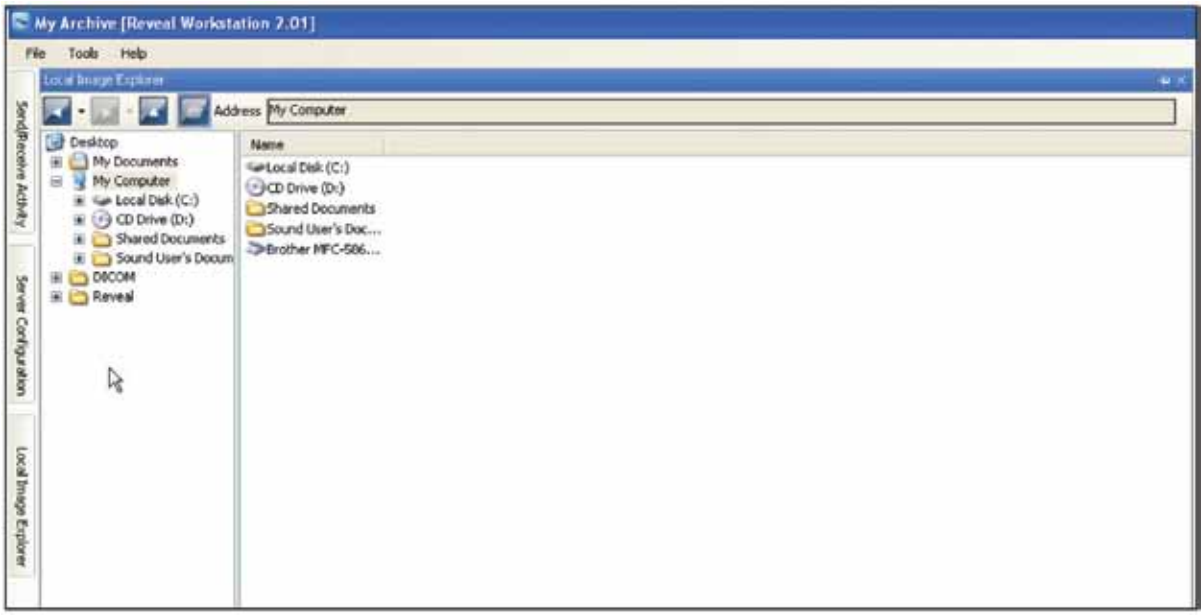
My Archive *(Continued)*

Importing a Study

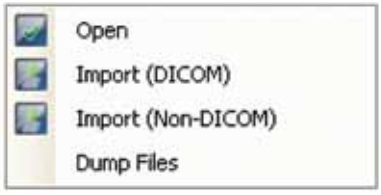
If you receive a study that was not acquired at your location, and you wish to view it in **Reveal™**, use the following steps to import the study:

1. Click the **Import Study** button.

2. Navigate to the location of the study on your computer.



3. Right-click on the study, and choose the import function you wish to use.



Open — Opens the images to view only Import
Import (DICOM) — Imports the study to this location of **Reveal™** only
Import (Non-DICOM) — Lets you view .jpg images in **Reveal™** (will save in this location only)
Dump Files — Removes the files for import

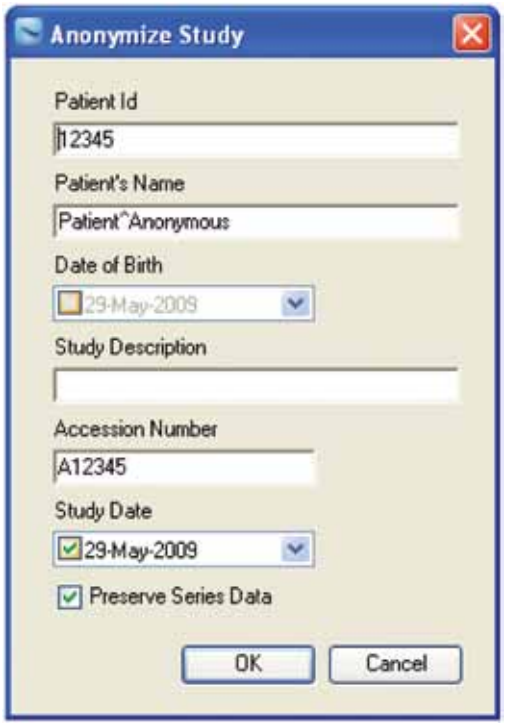
4. The images will now be viewable in **Reveal™**.

My Archive *(Continued)*

Anonymize Selected Study

This function of **Reveal™** lets you remove the information (such as Patient ID, Patient's Name, Date of Birth, Study Description, or Accession Number) from a study. These changes are made only locally, on your **Reveal™** workstation, and are not changed on any other Server. The anonymized study will be an additional study on your **Reveal™** workstation and will not overwrite the original study. To anonymize a study:

1. Click on the **Anonymize Selected Study** button.
2. Choose the changes you wish to make.
3. Click **OK** to save the changes.



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